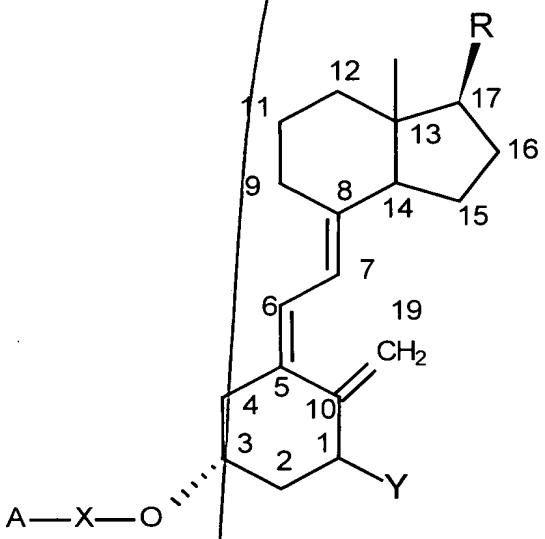
C L A I M S
(as originally filed)

1. Vitamin D derivative having the formula:



(I)

wherein:

O represents the oxygen atom of an ether group;

X represents a substituted or non-substituted hydrocarbon group of 0.8 to 4.2 nm length, which may have the usual heteroatoms such as S, O, N or P;

Y represents hydrogen or hydroxy;

A represents a tracer group, which can be bound with high affinity by a binding protein;

R represents a substituted or non-substituted hydrocarbon side group of vitamin D or of a vitamin D metabolite, a side group of vitamin D_2 or D_3, the 25-OH-side group of vitamin D_2 or D_3.

2. Vitamin D derivative according to claim 1, wherein A is selected from biotin, digoxigenin, tyrosine, FITC substituted tyrosine, substituted amino acid, charac-

teristic amino acid and peptide sequences, FITC, proteins and peptide groups, protein A, protein G, vitamin D derivatives, 25-OH-vitamin D.

3. Vitamin D derivative according to claim 1, wherein A is compound of the formula (I) which in the 3β-position is connected via an ether bridge to the spacer group X.

4. Vitamin D derivative according to any of claims 1 to 3, wherein the spacing group has the length of 0.8 to 2 nm, particularly preferably 0.9 to 1.5 nm.

5. Vitamin D derivative according to any of claims 1 to 4, wherein the spacing group is an amino carboxylic acid radical, an amino undecanoic acid radical or an amino polyether radical.

6. Method for producing vitamin D-derivative according to any of claims 1 to 5, including the steps: a) cyanoethylation of 25-hydroxy vitamin D with acrylonitrile in a mixture with acetonitrile, potassium hydride and tertiary butanol and b) reduction of the nitrile group with $LiH/LiAlH_4$.

7. Method for the quantitative detection of 25-hydroxy- and 1α,25-dihydroxy vitamin D metabolite in a sample, characterised in that a vitamin D derivative according to any of claims 1 to 5 is employed as a binding partner.

8. Method according to claim 7, wherein the method includes a protein binding analysis.

9. Method according to claim 8, wherein the method

includes the binding to a receptor.

10. Method according to claim 8, wherein the method includes a binding to an antibody.

11. Method according to claim 10, wherein the method is a competitive immunoassay, selected from RIA, EIA/ELISA, LiA and FiA.

12. Method according to claim 10, wherein the method is a sandwich immunoassay, selected from IRMA, IEMA/EUA, ILMA (immunoluminescence assay) and IFMA (immunofluorescence assay).

13. Method according to any of claims 7 to 12, including a solid phase, selected from a microtitration plate and other solid carriers, microparticles, preferably of agarose, polymeric material, cellulose, magnetic microparticles.

14. Method according to any claims 7 to 13, wherein the method is effected in a manner which can be automated, in liquid or solid phase.

15. Method for the detection of 25-hydroxy- and 1α,25-dihydroxy vitamin D-metabolites according to any of claims 7 to 14, including the steps: a) coating of a solid carrier with streptavidin; b) addition of biotin-vitamin D derivative according to any of claims 1 to 5; c) addition of the sample and a defined quantity of vitamin D-binding-protein; d) detection of the bound binding protein with labelled antibodies against vitamin D-binding protein.

16. Method for the detection of 25-hydroxy- and 1α,25-

dihydroxy vitamin D metabolites according to any of claims 7 to 14, including the steps: a) coating a carrier with antibodies against vitamin D-binding protein; b) addition of vitamin D binding protein; c) addition of the sample and a defined quantity of biotin coupled vitamin D-derivative according to claim 1; d) detection of the quantity of bound derivative with labelled streptavidin.

17. Method according to any of claims 7 to 16, whereby the detection is effected by means of marking with an enzyme which catalyses a detection reaction.

18. Reagent set for the detection of 25-hydroxy- and 1α,25-dihydroxy vitamin D metabolites in accordance with a method according to any of claims 7 to 17, characterised in that it has a standardised quantity of solid material or solution of a vitamin D-derivative according to any of claims 1 to 5.